

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-14 (canceled)

15. (currently amended): A method ~~for~~ of rapidly acquiring a spreading code, used in a code division multiple access (CDMA) system, the method comprising the steps of:

(a) generating a first long code and a second long code from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of the plurality of short codes embedded therein, ~~with each long code having a length N chips, with the first long code different from the second long code;~~

(b) transmitting, over a communications channel using radio waves, the first long code and the second long code, at a first phase angle and at a second phase angle, respectively, on a carrier signal, with the first phase angle different from the second phase angle; and

(c) acquiring, from the communications channel, using two phase-acquisition circuits in parallel, the first long code and the second long code from the first phase angle and the second phase angle, respectively, by searching, in parallel, $N/2$ chips, the first long code and the second long code.

16. (currently amended): The method ~~as set forth in~~ of claim 15, ~~with the step of transmitting including the step of~~ wherein step (b) further includes transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature phase~~ quadrature (Q) angle, respectively, on the carrier signal, with the ~~I-phase~~ I angle ninety degrees out of phase with the ~~Q-phase~~ Q angle.

17. (currently amended): The method ~~as set forth in~~ of claim 16, ~~with the step of acquiring including the step of~~ wherein step (c) further includes acquiring, from the communications channel, using an ~~I-phase acquisition~~ I-channel phase-acquisition circuit and a ~~Q-phase acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I-phase~~ I angle and the ~~Q-phase~~ Q angle, respectively, of the carrier signal by searching, in parallel, $N/2$ chips, of the first long code and the second long code.

18. (currently amended): The method ~~as set forth in~~ of claim 15, ~~with the step of transmitting including the step of~~ wherein step (b) further includes transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature phase~~ quadrature (Q) angle, respectively, ~~on the carrier signal, with the I phase angle ninety degrees out of phase with the Q phase angle.~~

19. (currently amended): The method ~~as set forth in~~ of claim 18, ~~with the step of acquiring including the step of~~ wherein step (c) further includes acquiring, from the communications channel, using an ~~I phase acquisition~~ I-channel phase-acquisition circuit and a ~~Q phase acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I phase~~ I angle and the ~~Q phase~~ Q angle, respectively, of the carrier signal by searching, in parallel, N/2 chips, of the first long code and the second long code.

Claim 20 (canceled)

21. (currently amended): The method ~~as set forth in~~ claim 20, ~~with the step of acquiring including the step of~~ claim 15 wherein step (c) further includes acquiring, from the communications channel, using the two phase-acquisition circuits in parallel, the embedded short codes ~~first short code embedded in the first~~

~~long code, and the second short code embedded in the second long code, from the first phase angle and the second phase angle, respectively, by searching, in parallel, N/2 chips, of each of the embedded short codes the first short code and the second short code.~~

22. (currently amended): A method ~~for~~ of rapidly acquiring a spreading code, used in a code division multiple access (CDMA) system, the method comprising the steps of:

(a) generating a plurality of P long codes from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of the plurality of short codes embedded therein, where P is a number of long codes in the plurality of long codes, ~~with each long code having a length N chips, with each long code different from other long codes in the plurality of long codes;~~

(b) transmitting, over a communications channel using radio waves, the plurality of long codes at a plurality of phase angles, respectively, on a carrier signal, with each phase angle in the plurality of phase angles different from other phase angles in the plurality of phase angles; and

(c) acquiring, from the communications channel, using phase-acquisition means, the plurality of long codes, respectively, by searching, in parallel, N/P chips, of each long code of the plurality of long codes.

Claim 23 (canceled)

24. (currently amended): The method ~~as set forth in claim 23, with the step of acquiring including the step of~~ claim 22 wherein step (c) further includes acquiring, from the communications channel, using the phase-acquisition means, the plurality of long codes from the plurality of phase angles, respectively, ~~of the carrier signal by searching, in parallel, N/P chips, of each of the plurality of long codes.~~

25. (currently amended): The method ~~as set forth in claim 23, with the step of transmitting including the step of~~ claim 22 wherein step (b) further includes transmitting the plurality of long codes at the plurality of phase angles, respectively, on the carrier signal, with each phase angle in the plurality of phase angles representing an M-ary phase scheme.

26. (currently amended): The method ~~as set forth in claim 25, with the step of acquiring including the step~~ of claim 22 wherein step (c) further includes acquiring, from the communications channel, using the phase-acquisition means, the plurality of long codes, respectively, of the carrier signal by searching, in parallel, N/P chips, of ~~the~~ a first long code and ~~the~~ a second long code.

Claim 27 (canceled)

28. (currently amended): The method ~~as set forth in claim 27, with the step of acquiring including the step~~ of claim 22 wherein step (c) further includes acquiring, from the communications channel, using the phase-acquisition means, the embedded short codes ~~first short code embedded in the first long code, and the second short code embedded in the second long code~~, from the a first phase angle and ~~the~~ a second phase angle, respectively, by searching, in parallel, N/P chips, of the embedded short codes ~~first short code and the second short code~~.

29. (currently amended): A code division multiple access (CDMA) system for rapidly acquiring a spreading code, ~~used in a code division multiple access (CDMA) system~~, the system comprising:

(a) generator means for generating a first long code and a second long code from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of the plurality of short codes embedded therein, ~~with each long code having a length N chips, with the first long code different from the second long code;~~

(b) transmitter means for transmitting, over a communications channel using radio waves, the first long code and the second long code, at a first phase angle and at a second phase angle, respectively, on a carrier signal, with the first phase angle different from the second phase angle; and

(c) acquisition means for acquiring, from the communications channel, using two phase-acquisition circuits in parallel, the first long code and the second long code from the first phase angle and the second phase angle, respectively, by searching, in parallel, N/2 chips, of the first long code and the second long code.

30. (currently amended): The system ~~as set forth in~~ of claim 29, ~~with wherein~~ said transmitter means further ~~including~~ includes means for transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature phase~~ quadrature (Q) angle, respectively, on the carrier signal, with the ~~I-phase I~~ angle ninety degrees out of phase with the ~~Q-phase Q~~ angle.

31. (currently amended): The system ~~as set forth in~~ of claim 30, ~~with~~ wherein said acquisition means further ~~including~~ includes means for acquiring, from the communications channel, using an ~~I-phase acquisition~~ I-channel phase-acquisition circuit and a ~~Q-phase acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I-phase~~ I angle and the ~~Q-phase~~ Q angle, respectively, of the carrier signal by searching, in parallel, N/2 chips, of the first long code and the second long code.

32. (currently amended): The system ~~as set forth in~~ of claim 29, ~~with~~ wherein said transmitter means further ~~including~~ includes means for transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature-phase~~ quadrature (Q) angle, respectively, ~~on the carrier signal, with the~~ I-phase angle ninety degrees out of phase with the Q-phase angle.

33. (currently amended): The system ~~as set forth in~~ of claim 32, ~~with~~ wherein said acquisition means further ~~including~~ includes means for acquiring, from the communications channel, using an ~~I-phase acquisition~~ I-channel phase-acquisition circuit and a ~~Q-phase acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I-phase~~ I angle and

the ~~Q-phase~~ Q angle, respectively, of the carrier signal by searching, in parallel, N/2 chips, of the first long code and the second long code.

Claim 34 (canceled)

35. (currently amended): The system ~~as set forth in claim 34, with~~ of claim 29 wherein said acquisition means further ~~including~~ includes means for acquiring, from the communications channel, using the two phase-acquisition circuits in parallel, the embedded short codes ~~first short code embedded in the first long code, and the second short code embedded in the second long code,~~ from the first phase angle and the second phase angle, respectively, by searching, in parallel, N/2 chips, of each of the embedded short codes ~~the first short code and the second short code.~~

36. (currently amended): A code division multiple access (CDMA) system ~~method~~ for rapidly acquiring a spreading code, ~~used in a code division multiple access (CDMA) system,~~ the ~~method~~ system comprising the steps of:

(a) generator means for generating a plurality of P long codes from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of

the plurality of short codes embedded therein, where P is a number of long codes in the plurality of long codes, ~~with each long code having a length N chips, with each long code different from other long codes in the plurality of long codes;~~

(b) transmitter means for transmitting, over a communications channel using radio waves, the plurality of long codes at a plurality of phase angles, respectively, on a carrier signal, with each phase angle in the plurality of phase angles different from other phase angles in the plurality of phase angles; and

(c) ~~aequisition~~ at least one phase-acquisition means for acquiring, from the communications channel, ~~using phase-acquisition means~~, the plurality of long codes, respectively, by searching, in parallel, N/P chips, of each long code of the plurality of long codes.

Claim 37 (canceled)

38. (currently amended): The ~~method as set forth in claim 37, with~~ system of claim 36 wherein said ~~aequisition~~ phase-acquisition means further ~~including includes~~ means for acquiring, from the communications channel, ~~using the phase-acquisition means~~, the plurality of long codes from the plurality of phase angles, respectively, ~~of the carrier signal by searching, in parallel, N/P chips, of each of the plurality of long codes.~~

39. (currently amended): The ~~method as set forth in claim 36, with~~ system of claim 36 wherein said transmitter means further ~~including~~ includes means for transmitting the plurality of long codes at the plurality of phase angles, respectively, on the carrier signal, with each phase angle in the plurality of phase angles representing an M-ary phase scheme.

40. (currently amended): The ~~method as set forth in claim 39, with~~ system of claim 36 wherein said ~~acquisition~~ phase-acquisition means further ~~including~~ includes means for acquiring, from the communications channel, ~~using the phase-acquisition means,~~ the plurality of long codes, respectively, of the carrier signal by searching, in parallel, N/P chips, of ~~the~~ a first long code and ~~the~~ a second long code.

Claim 41 (canceled)

42. (currently amended): The ~~method as set forth in claim 41, with~~ system of claim 36 wherein said ~~acquisition~~ phase-acquisition means further ~~including~~ includes means for acquiring, from the communications channel, ~~using the phase-acquisition means,~~ the embedded short codes ~~first short code of the short codes multiplicity embedded in the first long code of the long codes multiplicity, and the~~

~~second short code of the short codes multiplicity embedded in the second long code of the long codes multiplicity, from the a first phase angle and the a second phase angle, respectively, by searching, in parallel, N/P chips, of the embedded short codes first short code and the second short code.~~

43. (currently amended): A code division multiple access (CDMA) system for rapidly acquiring a spreading code, ~~used in a code division multiple access (CDMA) system~~, the system comprising:

(a) a code generator for generating a first long code and a second long code from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of the plurality of short codes embedded therein, ~~with each long code having a length N chips, with the first long code different from the second long code;~~

(b) a transmitter, coupled to said code generator, for transmitting, over a communications channel using radio waves, the first long code and the second long code, at a first phase angle and at a second phase angle, respectively, on a carrier signal, with the first phase angle different from the second phase angle; and

(c) an acquisition circuit, coupled to the communications channel, for acquiring, from the communications channel, using two phase-acquisition circuits in parallel, the first long code and the second long code from the first phase angle and

the second phase angle, respectively, by searching, in parallel, N/2 chips, of the first long code and the second long code.

44. (currently amended): The system ~~as set forth in~~ of claim 43, ~~with~~ wherein said transmitter further ~~including~~ includes means for transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature-~~ quadrature (Q) angle, respectively, on the carrier signal, with the ~~I-phase I~~ I angle ninety degrees out of phase with the ~~Q-phase Q~~ Q angle.

45. (currently amended): The system ~~as set forth in~~ of claim 44, ~~with~~ wherein said acquisition circuit further ~~including~~ includes means for acquiring, from the communications channel, using an ~~I-phase-acquisition~~ I-channel phase-acquisition circuit and a ~~Q-phase-acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I-phase I~~ I angle and the ~~Q-phase Q~~ Q angle, respectively, of the carrier signal by searching, in parallel, N/2 chips, of the first long code and the second long code.

46. (currently amended): The system ~~as set forth in~~ of claim 43, ~~with~~ wherein said transmitter further ~~including~~ includes means for transmitting the first long code and the second long code, at an in-phase (I) angle and at a ~~quadrature-~~

~~phase quadrature (Q) angle, respectively, on the carrier signal, with the I phase angle ninety degrees out of phase with the Q phase angle.~~

47. (currently amended): The system ~~as set forth in~~ of claim 46, ~~with wherein~~ said acquisition circuit further ~~including~~ includes means for acquiring, from the communications channel, using an ~~I phase acquisition~~ I-channel phase-acquisition circuit and a ~~Q phase acquisition~~ Q-channel phase-acquisition circuit in parallel, the first long code and the second long code from the ~~I phase~~ I angle and the ~~Q phase~~ Q angle, respectively, of the carrier signal by searching, in parallel, N/2 chips, of the first long code and the second long code.

Claim 48 (canceled)

49. (currently amended): The system ~~as set forth in claim 48, with~~ of claim 43 wherein said acquisition circuit further ~~including~~ includes means for acquiring, from the communications channel, using the two phase-acquisition circuits in parallel ~~circuit~~, the embedded short codes ~~first short code embedded in the first long code, and the second short code embedded in the second long code,~~ from the first phase angle and the second phase angle, respectively, by searching, in

parallel, $N/2$ chips, of each of the embedded short codes ~~the first short code and the second short code.~~

50. (currently amended): A code division multiple access (CDMA) system for rapidly acquiring a spreading code, ~~used in a code division multiple access (CDMA) system,~~ the system comprising ~~the steps of:~~

(a) a code generator for generating a plurality of P long codes from a plurality of short codes, wherein each of the short codes is different and has a length less than N chips, and each of the first and second long codes include a respective one of the plurality of short codes embedded therein, where P is a number of long codes in the plurality of long codes, ~~with each long code having a length N chips, with each long code different from other long codes in the plurality of long codes;~~

(b) a transmitter, coupled to said code generator, for transmitting, over a communications channel using radio waves, the plurality of long codes at a plurality of phase angles, respectively, on a carrier signal, with each phase angle in the plurality of phase angles different from other phase angles in the plurality of phase angles; and

(c) ~~an acquisition~~ at least one phase-acquisition circuit, coupled to the communications channel, for acquiring, from the communications channel, ~~using~~

~~said phase-acquisition circuit~~, the plurality of long codes, respectively, by searching, in parallel, N/P chips, of each long code of the plurality of long codes.

Claim 51 (canceled)

52. (currently amended): The system ~~as set forth in claim 51, with~~ of claim 50 wherein said ~~acquisition~~ phase-acquisition circuit further ~~including~~ includes means for acquiring, from the communications channel, ~~using the phase-acquisition circuit~~, the plurality of long codes from the plurality of phase angles, respectively, ~~of the carrier signal by searching, in parallel, N/P chips, of each of the~~ plurality of long codes.

53. (currently amended): The system ~~as set forth in~~ of claim 50 ~~with~~ wherein said transmitter further ~~including~~ includes means for transmitting the plurality of long codes at the plurality of phase angles, respectively, on the carrier signal, with each phase angle in the plurality of phase angles representing an M-ary phase scheme.

54. (currently amended): The system ~~as set forth in claim 53, with~~ of claim 50 wherein said ~~acquisition~~ phase-acquisition circuit further ~~including~~

includes means for acquiring, from the communications channel, ~~using the phase-acquisition circuit,~~ the plurality of long codes, respectively, of the carrier signal by searching, in parallel, N/P chips, of ~~the~~ a first long code and ~~the~~ a second long code.

Claim 55 (canceled)

56. (currently amended): The system ~~as set forth in claim 55, with~~ of claim 50 wherein said ~~acquisition~~ phase-acquisition circuit further ~~including~~ includes means for acquiring, from the communications channel, ~~using the phase-acquisition circuit,~~ the embedded short codes ~~first short code embedded in the first long code, and the second short code embedded in the second long code,~~ from ~~the~~ a first phase angle and ~~the~~ a second phase angle, respectively, by searching, in parallel, N/P chips, of the embedded short codes ~~first short code and the second short code.~~